U.S. Army Corps of Engineers

Action Memorandum
Volume II Engineering Evaluation/Cost Analysis
Former Honey Lake Demolition Range - Dry Lake Area
Sierra Army Depot
Lassen County, California

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DECLARATION

This Volume II Engineering Evaluation/Cost Analysis (EE/CA) Action Memorandum represents the selected munitions response actions for the Dry Lake Area of the Former Honey Lake Demolition Range, Sierra Army Depot, Lassen County, California. The U.S. Army is the lead agency under the Defense Environmental Restoration Program at the Sierra Army Depot and has developed this Action Memorandum in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, to be consistent with the National Contingency Plan. This decision document has been prepared based on the administrative records developed for the Dry Lake Area project site. The U.S. Army has selected the Subsurface Removal of Munitions and Explosives of Concern (MEC) to 1 Foot over the Open Burn/Open Detonation (OB/OD) Sector, the Surface Removal of MEC over the Buffer Sector, Institutional Controls for the Periphery Sector, and the implementation of 5-Year Reviews, as described in this Action Memorandum, as the most appropriate means to conduct a Non-Time Critical Removal Action for the portion of the Honey Lake Prime Parcel (i.e., Dry Lake Area) that lies within the boundaries of the Former Honey Lake Demolition Range. The California Department of Toxic Substances Control and the California State Lands Commission concur with the response actions selected by the Army. This document has been approved by the undersigned.

Approval:

_____ _____

TBD Date
TBD

ENGINEERING EVALUATION/COST ANALYSIS
ACTION MEMORANDUM

Dry Lake Area
Former Honey Lake Demolition Range
Sierra Army Depot
Lassen County, California

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1.0 INTRODUCTION

The U.S. Army Engineering and Support Center, Huntsville (CEHNC), and the U.S. Army Corps of Engineers (USACE), Sacramento District (CESPK), teamed to produce the Engineering Evaluation/Cost Analysis (EE/CA) Report for the Dry Lake Area of the Former Honey Lake Demolition Range, Sierra Army Depot, Lassen County, California to evaluate and recommend the most appropriate munitions response action(s) to reduce the risk of munitions and explosives of concern (MEC) to the public. This Action Memorandum presents the munitions response actions identified in the EE/CA Report and selected for implementation at the Dry Lake Area of the Former Honey Lake Demolition Range.

2.0 STATEMENT AND PURPOSE OF SCOPE

Site Description. The 4,486-acre Dry Lake Area of the Former Honey Lake Demolition Range (situated in the northwest region of the Sierra Army Depot) is northwest of the unincorporated community of Herlong in the Honey Lake area of Lassen County, California, approximately 40 miles southeast of Susanville, California, and 55 miles northwest of Reno, Nevada (see Figure 1).

The project site lies approximately 3,900 feet above mean sea level in the Honey Lake Valley along the northeast flank of the Sierra Nevada Mountain Range. The Honey Lake Valley is in a topographically closed basin at the juncture of three geologic and physiographic provinces. To the north are the volcanic cones and flows of the Modoc Plateau, to the east is the Basin and Range Physiographic Province, and to the west and south lies the north edge of the Sierra Nevada Mountain Range. The topography of the Honey Lake Valley is relatively flat with topographic relief surrounding the project site generally ranging from 1 to 3 feet south to north and approximately 1 to 10 feet west to east.

Honey Lake is a closed basin intermittent lake that is fed by two major tributaries, the Susan River to the north and Long Valley Creek to the south. The lake is also fed by other minor sources that enter the lake along its western shoreline. Since there are no natural outlets to Honey Lake the water level is primarily regulated by precipitation within the watershed (e.g., the amount of snow in the surrounding mountain ranges), from irrigation run-off into the lake, and by evaporation from and the amount of water pumped from the lake to irrigate adjacent farmlands.

Site History. In 1941, the Army selected the land east of Honey Lake as the site to establish the Sierra Ordnance Depot. Construction of the Depot began in 1942. In 1944, the parcel containing Honey Lake was transferred from the State of California to the Depot under a reversion clause. The Sierra Ordnance Depot was later renamed as the Sierra Army Depot.

The Depot conducted demolition and burning of excess, unserviceable, and/or obsolete munitions following World War II. The first documented demolition activity occurred in 1945 on the dry lakebed of Honey Lake and consisted of

600 105-millimeter (mm) antitank rounds. Another documented demolition consisting of M1 antitank mines occurred in 1946. Use of the lakebed for demolition and burning continued into the 1950s. It is unclear when demolition activities on the lakebed were discontinued, although a 1954 newspaper article identified demolition activity being conducted at the site of the present open burn/open detonation (OB/OD) area. Historical records (including 16mm films) indicate that the Honey Lake Demolition Range was in use until 1951, and possibly into the late 1950s.

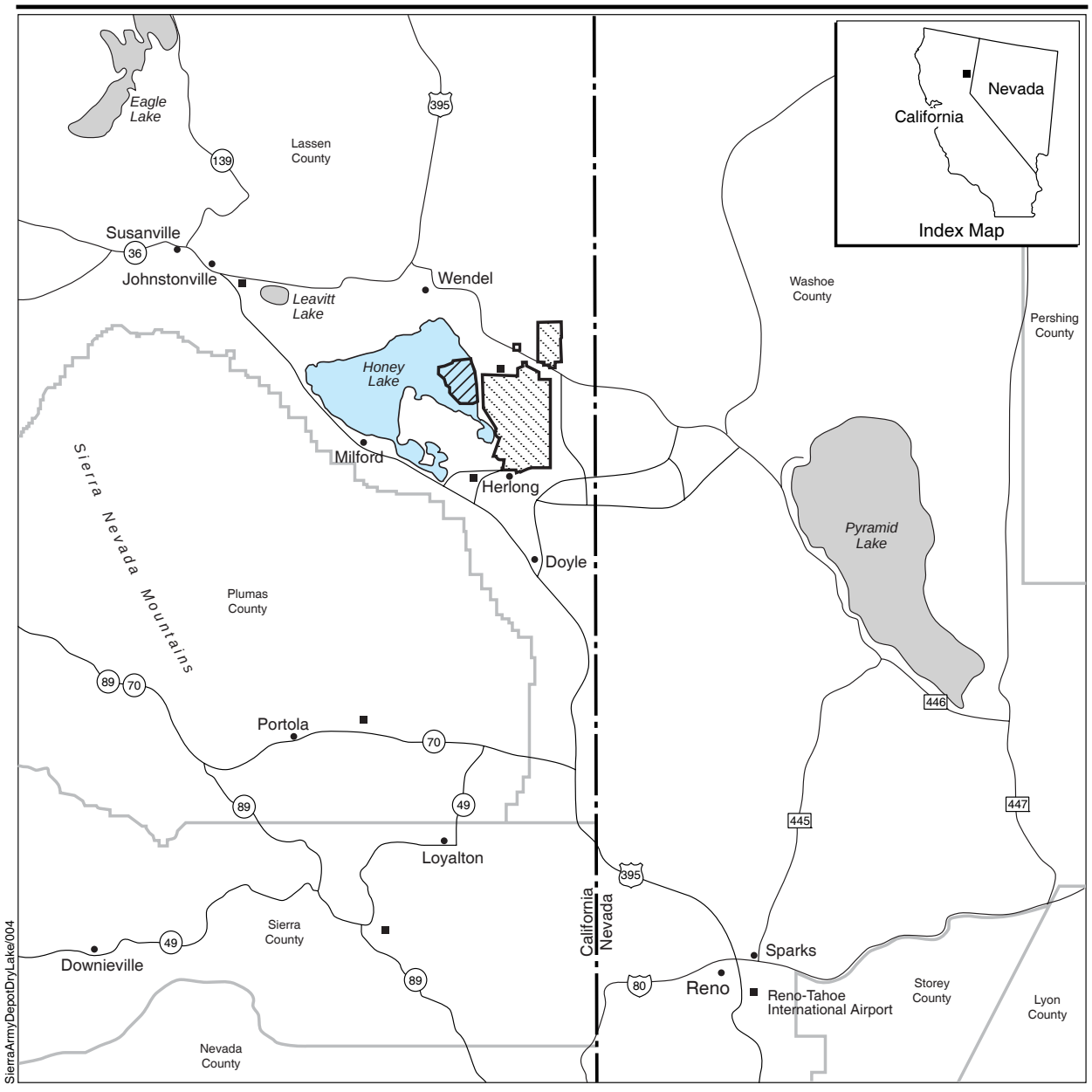
The U.S. Army transferred the majority of Honey Lake to the Honey Lake Conservation Team (HLCT) in 2003. The Dry Lake Area will be transferred to the California State Lands Commission (SLC) after all administrative requirements for the SLC to accept the property, have been met. Because of the remaining MEC hazard, the Dry Lake Area was leased to the HLCT and will be transferred to the SLC once all MEC removal actions are completed.

EE/CA Process. The scope of the Dry Lake Area EE/CA was limited to the evaluation of risk to human safety associated only with the explosive hazards of MEC which include unexploded ordnance (UXO) and discarded military munitions (DMM) and chemical hazards of MEC or munitions constituents (MC). The EE/CA Report documents the decision process to determine the most appropriate munitions response actions for the 4,486-acre Dry Lake Area of the Former Honey Lake Demolition Range.

This decision document presents the selected actions for the Dry Lake Area, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and is consistent with the National Oil and Hazardous Substances Pollution contingency Plan (NCP). The basis for this decision is documented in the Administrative Record for this site. This record is available at the Sierra Army Depot, Building 75; the Herlong Public Library; the Susanville Public Library; the Reno Public Library; and the California Department of Toxic substances Control's (DTSC) Sacramento Office. The State of California concurs with the selected remedy.

3.0 PROJECT JUSTIFICATION

The data collected during the EE/CA field investigation was used to perform a qualitative risk evaluation for assessing the military munitions risk to public safety and the environment at the Dry Lake Area of the Former Honey Lake Demolition Range. The qualitative risk analysis was completed based on the CEHNC Ordnance and Explosives Risk Impact Assessment (OERIA) evaluation tool. Results of the evaluation concluded that the overall explosive public safety risk for the OB/OD and Buffer Sectors is moderate and low for the Periphery Sector. The site is considered to have military munitions that are sensitive and may kill or cause serious injury to an individual if detonated by the individual's activities.



EXPLANATION

- County Boundary
- State Boundary
- Interstate Highway (80)
- U.S. Highway (395)
- California State Highway (89)
- Nevada State Highway (445)
- Sierra Army Depot Boundary
- Sierra Army Depot
- Dry Lake Area
- Honey Lake
- Airports

0 3 6 12 Miles

Regional Map

Figure 1

White phosphorus rounds were recovered from three different grids within the OB/OD Sector. Similar DMM items are almost certain to remain in these areas and may pose a risk to those accessing the site. For example, the white phosphorus rounds recovered were evaluated as being military munitions that are sensitive and as munitions that may kill or seriously injure an individual if detonated by the individual's activities. Warning signs are presently in place around the perimeter of Dry Lake Area, otherwise the public has open access to the site. However, the Dry Lake Area is only accessible by unimproved dirt roads. Additionally, there are no residential areas located near the project site and there is nothing associated with the Dry Lake Area that would attract the public to that area.

4.0 RESPONSE ACTION ALTERNATIVES CONSIDERED

Seven munitions response action alternatives were evaluated in the Dry Lake Area EE/CA Report (Earth Tech, June 2006). The evaluation analyzed the effectiveness, implementability, and cost of each of the following alternatives:

Alternative 1 - No Action Alternative. None of the other munitions response alternatives would occur under this alternative. However, No Action includes the Formerly Used Defense Sites (FUDS) program reviewing any new information regarding the MEC hazards associated with past U.S. Army activities at the Dry Lake Area, as it becomes available. If MEC is discovered in the future, the Army will reconsider the status of the property. No Action is indicative of a determination that is open to further and future review of an area.

Alternative 2 - Institutional Controls. Institutional Controls protect property owners and the public from hazards present at a site by warning of the possible presence of MEC and/or limiting the access or use of a site. Institutional Controls include the use of engineering controls (e.g., fences), educational programs (e.g., informational pamphlets), and legal mechanisms (e.g., land use covenants). The overall effectiveness of Institutional Controls depends entirely on regulatory agencies and private landowner support, involvement, and willingness to enforce and maintain Institutional Controls implemented to eliminate public interaction with MEC.

Alternative 3 - Surface Removal of MEC. This munitions response action alternative includes the location and removal of ordnance from the ground surface. Teams of UXO-qualified personnel would visual search for and remove all MEC items from the ground surface within a specified area.

Alternative 4 - Subsurface Removal of MEC to 1-Foot Utilizing the Best Appropriate Technology. This munitions response action alternative includes the subsurface detection (using geophysical instrumentation), excavation, and removal of all MEC items within a specified area to a depth of 1-foot below ground surface (bgs).

Alternative 5 - Subsurface Removal of MEC to Depth Utilizing the Best

Appropriate Technology. This munitions response action alternative includes the subsurface detection (using geophysical instrumentation), excavation, and removal of all MEC items within a specified area regardless of depth.

Alternative 6 - Construction of a Soil Cap. This munitions response action alternative includes the construction of a soil cap, approximately 2-feet thick, over the Dry Lake Area as a barrier between anyone accessing the area and any remaining MEC hazard.

Alternative 7 - Army Retention. This munitions response action alternative consists of the Army retaining the Dry Lake Area. This alternative would include installing a fence and maintaining administrative controls (i.e., warning signs) around the perimeter of the site to prevent access to any remaining MEC hazard at the Dry Lake Area.

A more detailed description of the seven munitions response action alternatives can be found in Chapter 6.0 of the EE/CA Report (Earth Tech, June 2006).

5.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

All public involvement requirements identified under the EE/CA process have been met. All public/community relations support was coordinated through CESPK, who ensured that the local community was informed by providing project status briefings and allowing open discussion of project-related activities for the Dry Lake Area EE/CA at quarterly Restoration Advisory Board (RAB) held at the Sierra Army Depot. Additionally, DTSC has been provided project status updates and have been involved with evaluation of the munitions response action alternatives throughout the development of the Dry Lake Area EE/CA.

On **TBD** July 2006, a public meeting was held at **TBD** to present the findings of the Preliminary Final EE/CA Report (Earth Tech, May 2006) to the public and to receive public and regulatory agency comments to the EE/CA Report. Prior to the meeting the public was notified that copies of the Preliminary Final EE/CA Report were available for review at a number of locations that have been established for the project. These repository locations include the Sierra Army Depot, Building 75; the Herlong Public Library; the Susanville Public Library; the Reno Public Library; and the DTSC Sacramento Office. The repositories contain documents that were prepared in support of the MEC investigation at the Dry Lake Area and that are accessible to the public.

6.0 COORDINATION SUMMARY

Project activities for the Dry Lake Area EE/CA were coordinated with CEHNC, CESPK, the Army BRAC Division (BRACD), and a number of state and local agencies, such as DTSC, the SLC, the Lassen County Local Reuse Authority (LCLRA), and the HLCT. Project Work Plans were reviewed by the aforementioned U.S. Army organizations as well as DTSC. The U.S. Army organization also met with DTSC, the SLC, and the HLCT several times during the development of the Dry Lake Area EE/CA. Project documents were made available to project stakeholders and public via the Administrative Record.

Key Contacts for state officials include:

- California Department of Toxic Substances Control (DTSC), Mr. Charlie Ridenour (Chief of Federal Facilities Unit, Office of Military Facilities),
- California State Lands Commission (SLC), Mr. Dave Plummer, Regional Manager.

7.0 SELECTION CRITERIA

Each of the seven munitions response action alternatives was evaluated against the following criteria. These criteria are discussed in greater detail in Section 6.3 of the EE/CA Report. The evaluation of each of these criteria can be found in Section 6.5 of the Dry Lake Area EE/CA Report. The selection criteria used to evaluate the munitions response action alternatives include:

Effectiveness. Effectiveness is a measure of a munitions response action's ability to reduce the potential for exposure to or interaction with MEC. Effectiveness takes into account the overall protection of human safety, compliance with applicable or relevant and appropriate requirements (ARARs), both long- and short-term effectiveness, and hazard reduction.

Implementability. Implementability is a measure of whether a munitions response action can be physically and administratively conducted. Implementability takes into account technical and administrative feasibility, availability of services and materials, and both regulatory agency and public acceptance.

Cost. Cost is simply the estimated investment cost of each munitions response action alternative.

8.0 DESCRIPTION OF SELECTED REMEDY

The results of the EE/CA indicate that there is a public safety risk associated with MEC at Dry Lake Area portion of the Former Honey Lake Demolition Range. The munitions response actions selected for each sector of the Dry Lake Area are were based upon the following information:

- A Time Critical Removal Action (TCRA) was performed in 2003 to eliminate or reduce the potential danger to public safety from DMM on the surface of the Dry Lake Area. An additional surface clearance may be required in the future because MEC items may become exposed due to wind and water erosion of the lakebed surface.

- Results of the EE/CA field investigation and interpretation of the airborne magnetic data suggest there are numerous subsurface pits filled with ferrous metal (most likely DMM and/or munitions debris [MD]) within the OB/OD Sector. However, the EE/CA investigation found that the demolition pits were well below the surface of the lakebed and due to soil conditions these pits would be very difficult to access.

- OERIA determined that there is a moderate to low MEC risk level at the Dry Lake Area because MEC may still remain within the Dry Lake Area and because the site, although remote, is still accessible to the general public.

- Honey Lake intermittently fills with water or results in wet or muddy conditions that impede or deny public access to any potential MEC that may remain on site.

Figure 2 shows the munitions response actions that will be implemented for each sector at the Dry Lake Area and a description of these response actions are provided below:

OB/OD Sector. The EE/CA field investigation recovered 138 DMM items from the surface to a depth of 72-inches bgs within the OB/OD Sector. In order to help protect the public from inadvertently encountering MEC just below the surface, a Subsurface Removal of MEC to 1-Foot Utilizing the Best Appropriate Removal Technology has been selected for implementation over the 1,737 acres of the OB/OD Sector (see Figure 2) and is based upon the following:

A Subsurface Removal of MEC to 1 Foot includes a surface removal (Alternative 3) followed by excavation and removal of all detected subsurface ordnance items up to a depth of 1-foot bgs. A remedy of this sort removes detectable hazards and provides effective risk reduction for areas subject to both surface and limited intrusive activities (e.g., recreational activities).

The various geophysical methods that would be used to detect subsurface ordnance would be tested prior to use to selecting the equipment that would best meet the project objectives. Subsurface anomaly locations would be intrusively investigated to a depth of 1 foot by UXO-qualified personnel to identify the anomaly source. If heavy concentrations of metallic debris are encountered, soil sifting technologies may be utilized. Sifting technologies include dig and haul

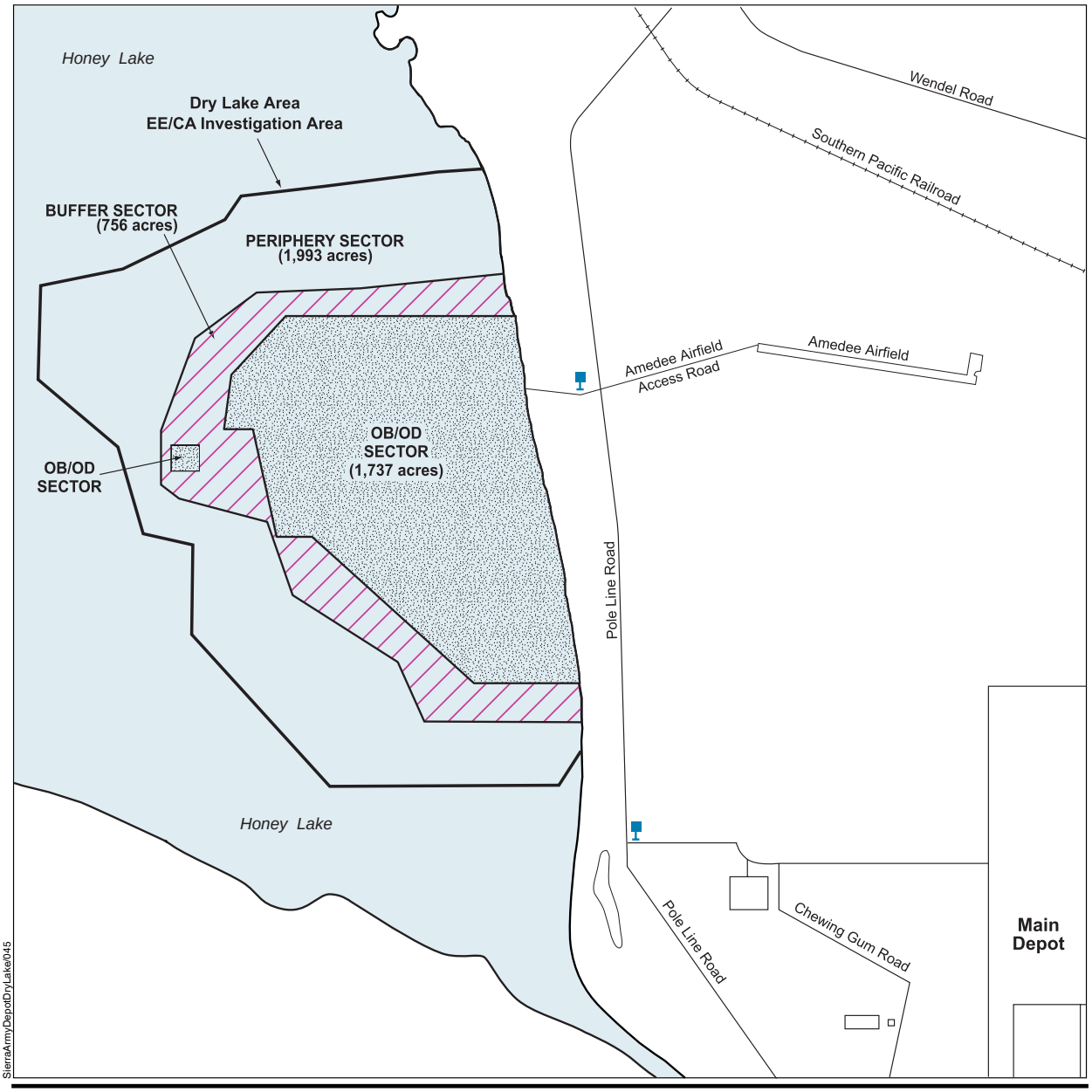
techniques and methods that perform digging and sifting as a single process. MEC recovered from the OB/OD Sector during the intrusive investigation would be relocated, if safe, and moved for disposal, or detonated in place after obtaining permission from the appropriate regulatory agency and establishment of a public safety exclusion zones sized to provide a safe distance from the MEC item(s) being detonated. Dust suppression measures (e.g., application of water to ground surface prior to excavation) will be employed throughout the MEC removal process and will be discussed in detail in the Dry Lake Area Response Action Work Plan.

Under California law, blow-in-place procedures constitute the treatment of hazardous waste and require either a California Hazardous Waste Treatment Permit, or a Remedial Action Plan approved by the DTSC. On-site response actions carried out as part of CERCLA do not require a formal permit, but must meet the substantive provisions of such a permit. This document and the associated Dry Lake Area Response Action Work Plan (to be developed) provide documentation that all substantive requirements have been addressed for the treatment of ordnance related materials from the Dry Lake Area. Items that are not contaminated with explosive residues will be handled as scrap metal. Items containing explosive components that are acceptable to move will be placed into secured storage and transported to an approved, off-site disposal facility at the conclusion of field work.

A Subsurface Removal of MEC to 1 Foot over the OB/OD Sector does not include unlimited intrusive activities because no removal of MEC based on aboveground-deployed detection methods can be 100 percent effective. Intrusive activities requiring excavations below the level of MEC removal in known MEC areas should be evaluated and, if necessary, performed only in conjunction with construction support.

The implementation of a Subsurface Removal of MEC to 1-Foot would also incorporate all appropriate Institutional Controls (Alternative 2) necessary to support this remedy for the OB/OD Sector.

This alternative can be implemented with the use of specially trained personnel and equipment and would remove those MEC items that could be easily accessed by individuals that visit the site and would provide a substantial level of protection of public health and the environment. Although a TCRA was conducted over this area in 2003, implementing this alternative would remove any new MEC items that may have been exposed by wind and water erosion since the completion of the TCRA, plus add an extra level of risk reduction by clearing all MEC to 1-foot bgs. Additionally, the Dry Lake Area is part of Honey Lake, which is an intermittent lake, and there have been no changes in land use identified for this site. Therefore, implementation of this munitions response alternative exceeds Department of Defense (DOD) Standard 6055.9, Ammunition and Explosives Safety Standard for open space land use (5 October 2004) (Figure 2).



EXPLANATION

- Dry Lake EE/CA Investigation Area (4,486 acres)
- Surface Clearance of DMM (756 acres)
- Subsurface Clearance of DMM to 1-foot (1,737 acres)
- Proposed Display Case Location
- DMM Discarded Military Munitions
- EE/CA Engineering Evaluation/Cost Analysis
- OB/OD Open Burn/Open Detonation

0 .25 .5 1 Mile

Note: (1) Institutional Controls including display cases, community awareness meetings, information brochures and land use/ zoning restrictions.
(2) Warning signs are already in place around the Dry Lake Area.

Recommended MEC Response Actions

Figure 2

The estimated cost for implementation of a Subsurface Removal of MEC to 1-Foot over the OB/OD Sector is $13,388,453 (Table 1). Estimated cost data for this munitions response action is detailed in Appendix H of the EE/CA Report.

Buffer Sector. Only 2 DMM items were recovered at 4- and 6-inches bgs and 124 MD items were recovered from the Buffer Sector as a result of the EE/CA investigation. Therefore, a Surface Removal of MEC (Alternative 3) is recommended over the 756 acre Buffer Sector (Figure 2).

A Surface Removal of MEC comprises locating and removing ordnance from the ground surface. Teams of UXO-qualified personnel use visual identification to search for and remove ordnance. The surface removal would be conducted by establishing a system of grids within which a series of sweep lanes would be placed. These lanes are typically 5 feet in width or narrower and are installed to ensure that all MEC related items are systematically removed from each grid.

MEC recovered during the surface removal would be detonated in place if it were not safe to move to an on-site area specifically designated for destruction of recovered MEC items. The removal of MEC from the surface of the Buffer Sector and the detonation of MEC would occur within safety exclusion zones, which vary in size, depending on the maximum fragmentation range of the MEC items recovered. As discussed above, this Action memorandum and the Dry Lake Area Response Action Work Plan (to be developed at a later date) will provide the documentation that all substantive requirements have been addressed in accordance with DOD 6055.9 STD for the treatment of ordnance related materials from the Dry Lake Area. MD recovered during the surface removal would be turned in to the nearest Defense Reutilization Marketing Office (DRMO), or taken off site and turned in to an authorized scrap metal recycler.

This alternative can be implemented with the use of specially trained personnel and equipment and would remove those MEC items that could be easily accessed by individuals that visit the site and would provide a substantial level of protection of public health and the environment. Although a TCRA was conducted over this area in 2003, implementing this alternative would remove any new MEC items that may have been exposed by wind and water erosion since the completion of the TCRA. Additionally, the Dry Lake Area is part of Honey Lake, which is an intermittent lake, and there have been no changes in land use identified for this site.

The evaluation of this response action alternative will also consider and incorporate all appropriate Institutional Controls (Alternative 2) necessary to support the Surface Removal of MEC from the Buffer Sector.

The estimated cost for implementation of a Surface removal of MEC from the Buffer Sector is $1,032,025 (Table 1). Estimated cost data for this munitions response action is detailed in Appendix H of the Dry Lake Area EE/CA Report.

Table 1. Estimated Costs for Recommended Munitions Response Actions

Sector/Area	Total Acreage	Total MEC[a] (UXO, DMM, and MC)	Total MD (tons)[a]	Recommendations	Estimated Cost
Dry Lake Area				Institutional Controls[d], including display cases, community awareness briefings, landowner notification, development of informational pamphlets, and land use covenant.	**$176,105**
				5-Year Reviews (total of 4 reviews).	**$409,924**
OB/OD Sector	1,737	138 DMM	10.0	Subsurface Removal of MEC to 1-Foot.	**$13,388,453**[e]
Buffer Sector	756	2 DMM	0.5	Surface Removal of MEC.	**$1,032,025**[f]
Periphery Sector	1,993	105 DMM[b]	<0.5	Institutional Controls (see above)[d].	**$ --**[g]
Total	**4,486**	**245**[c]	**11.0**[c]		**$15,006,507**

Notes:
(a) Results of EE/CA field investigation conducted by Earth Tech in 2003.
(b) These DMM items were believed to be a one-time abandonment of 40mm rounds and not indicative of standard ordnance demilitarization practices at the Former Honey Lake Demolition Range.
(c) An additional 53,212 DMM items and over 250 tons of MD was recovered and removed during the TRCA conducted in 2003.
(d)
(e) Costs are based on the utilization of a mechanized MEC removal system over 75 percent of the area.
(f) Surface removal will be conducted concurrently with the Removal of MEC to 1-Foot for the OB/OD Sector, therefore, one time costs (e.g., Work Plan) are included as part of the response action costs for the OB/OD Sector.
(g) Implementation of the recommended Institutional Controls will serve the entire Former Honey Lake Demolition Range and costs have been provided above.

< = less than
DMM = discarded military munitions
EE/CA = Engineering Evaluation/Cost Analysis
MC = munitions constituents
MD = munitions debris
MEC = munitions and explosives of concern
OB/OD = open burn/open detonation
UXO = unexploded ordnance

Periphery Sector. Although 105 40-millimeter (mm) projectiles were recovered from the surface at a single location within the Periphery Sector, the EE/CA and TCRA data indicate that this was an isolated event and not indicative of the ordnance demilitarization practices implemented at the Former Honey Lake Demolition Range, including the Dry Lake Area. With the exception of the aforementioned DMM items, only nine MD and no DMM items were recovered from the Periphery Sector. However, this sector carries a low MEC hazard due to the possibility that the area could be accessed by the general public. Given that little benefit, in terms of hazard reduction, would be gained through implementation of any additional removal actions, Institutional Controls are considered sufficient protection of the public and are recommended for this sector (Figure 2).

Institutional controls put into place for the Periphery Sector will be effective for all sectors and include:

- Installation of two bilingual (English and Spanish) educational display cases at access points entering the Dry Lake Area,
- Development and distribution of informational pamphlets to local residence and at each display case location,
- Community awareness briefings at RAB meetings,
- Notification of local landowners,
- Implementation of land use controls.

The cost for implementation of Institutional Controls is $176,105 (Table 1). Estimated cost data for this munitions response action is detailed in Appendix H of the Dry Lake Area EE/CA Report, while more detailed descriptions of Institutional Controls are provided below.

Objectives of Institutional Controls. Institutional Controls, including Land Use Controls (LUCs) will be necessary at the Honey Lake Dry Lake Area because MEC will be left below the surface of the lakebed. The objective of the selected Institutional Controls are to help prevent human exposure to any remaining MEC at the Dry Lake Area and to complement the planned remedial actions selected for the Dry Lake Area.

Institutional Controls will apply to the whole Dry Lake Area (i.e., OB/OD, Buffer, and Periphery Sectors) (Figure 2) and will help prevent the public from inadvertently contacting any remaining MEC hazards. Specific language is included in this Action Memorandum regarding implementation, monitoring, reporting and enforcement of Institutional Controls. Further details for the implementation of the Land Use Controls (LUCs) will be described in depth on the Remedial Action Work Plan. Therefore, compliance with the terms of this Action Memorandum will be protective of human health and the environment. Because the restrictions and the means for implementing the restrictions are specifically described in the following subsections, it is not necessary for the Army to submit any new, post-Action Memorandum Institutional Controls implementation documents, such as a LUC Implementation Plan, or new operation and maintenance plans.

The Institutional Controls Alternative (Alternative 2) includes an enforceable use restriction and institutional control on the use of the Dry Lake Area of the Former Honey Lake Demolition Range. The Army is responsible for implementing, maintaining and monitoring the remedial actions (including the Institutional Controls) before property transfer. The property owner will be responsible for maintaining the Institutional Controls unless noted. The Army will exercise this responsibility in accordance with CERCLA and the National Contingency Plan.

The protection of human health and the environment shall be the primary and fundamental indicator of Institutional Controls performance. It is anticipated that successful implementation, operation, maintenance and completion of these measures will achieve protection of human health and the environment and compliance with all legal requirements.

The Army may contractually arrange for third parties to perform any of the actions associated with Institutional Controls, although the Army is ultimately responsible under CERCLA for the successful implementation of Institutional Controls, including monitoring, maintenance and review of Institutional Controls. Monitoring, maintenance and other controls as established in accordance with this Action Memorandum and the appropriate transfer documents will be continued until Institutional Controls are no longer necessary.

The Dry Lake Area is contaminated with MEC and is currently leased to the Center for Urban Watershed Renewal (CUWR) (Lease in Furtherance of Conveyance). Under the lease terms CUWR will manage the property, but is not allowed to access it without prior written approval and escort from the Army. The lease restrictions are in place and operational and will remain in place until the property is transferred by deed. At the time of deed transfer, lease restrictions will be superseded by restrictions to be included in the federal deed and the State Land Use Covenant as described in this Action Memorandum.

Description of Institutional Controls. The Institutional Controls to implemented at the Dry Lake area will consist of the following measures:

Installation of educational display cases. Two bilingual (English and Spanish) educational display cases will be installed at access points entering the Dry Lake Area.

These display cases will provide notice and information regarding the munitions hazards present at a site. The display cases will be installed at locations that so that they will give notice to anyone accessing the area that inappropriate uses of the site must be avoided, as well as deter access to a site. While these display cases may not provide the physical barrier against accessing the area they have the added benefit of providing information to the public concerning the nature of the hazard present at a site in areas where fencing may not be possible. Finally, the display cases will inform the public of potential safety hazards and communicate the following information:

1. Why a safety hazard exists in the context of the history of the military installation or training area

2. Show the types of ordnance used at the site, provide visual schematics/photographs that can be used to educate the public concerning the hazards associated with MEC, and provide information concerning whom to contact if MEC is found.

3. How to avoid encountering an MEC item (e.g., by staying on specified roads and trails where MEC has been removed, and by avoiding access and/or excavation in areas of suspected MEC)

4. What to do and whom to contact if a suspected MEC item is encountered.

Development and Distribution of Informational Pamphlets. Informational pamphlets will be developed and distribution to local residence and will be available at each display case location.

Informational pamphlets will be developed and distributed as an effective community educational tool. The informational pamphlets will be developed to warn the public of the hazards of ordnance in the historical context of past military operations that occurred at the Former Honey Lake Demolition Range, including the Dry Lake Area. The informational pamphlets can be mailed to residents in the vicinity of the Dry Lake Area or they can be distributed from central locations such as local libraries, or posted at the educational display cases which will be installed as part of the selected remedy. The informational pamphlets will contain photographs and/or drawings of typical ordnance items previously recovered from the site and that the public might encounter should they access the site. A telephone number for contacting the appropriate local authority will be provided on the pamphlets should any MEC items be discovered at the Dry Lake Area. The initial distribution and development of educational materials would be funded by the Army. Long-term implementation would be the responsibility of landowners and local agencies.

Community Awareness Briefings. Community awareness briefings regarding the status/progress of the selected remedies for the Dry Lake Area will be conducted at quarterly Restoration advisory Board (RAB) meetings held at the Sierra Army Depot.

Educating the local community is an extremely important part of any institutional control program. Generally, if people are aware of and understand the hazards associated with a site impacted with MEC, they will take the necessary precautions to avoid exposure. Education programs can be tailored to meet the specific needs of a particular audience (e.g., local homeowners, school children, regulators, and developers) and can be performed as often as necessary to educate those that are at greatest risk for exposure to MEC. Educational efforts constitute a viable stand-alone institutional control, but can also improve the effectiveness of other controls that are part of the overall program.

RAB meetings have been selected as the forum which will educate the local community as to any remaining risk from MEC at the Dry Lake Area. A RAB is an advisory body designed to act as a focal point for the exchange of information between an installation, in this case the Sierra Army Depot, and the local community regarding environmental restoration activities. The RAB is intended to bring together community members who reflect the diverse interests within the local community, enabling the early continued two-way flow of information, concerns, values, and needs between the affected community and the (name of site or district). RAB members meet regularly (e.g., quarterly) to review and comment on technical documents and plans relating to the ongoing environmental studies and restoration activities at the depot. Members will be expected to serve as liaisons with the community and be available to meet with community members and groups as necessary. All RAB meetings are open to the public and technical support staff will be available to provide informational support and explanation to RAB members and the public.

Notification of Local Landowners. Local landowners with property located adjacent to the Dry Lake Area will be contacted by the U.S. Army. Such a contact will be conducted by mail and include the following information: (1) results of the Dry Lake Area EE/CA Report; (2) description of all response actions to be implemented at the Dry Lake Area; and (3) a the schedule for implementation of the selected remedies. The Army will also provide a Point-of-Contact and a method (e.g., telephone number or mailing address) to contact this individual should any local landowners have any question or concerns regarding implementation of any of the selected remedies for the Dry Lake Area.

Five Year Reviews. All sites where a munitions response action is implemented require 5-Year Reviews. CERCLA 121 (c) requires the review of MEC response actions no less than every 5 years to assure that human health and the environment are being protected. Additionally, the NCP states that if a response action is selected that results in contaminants (e.g., MEC) remaining at the site, the lead agency (i.e., the Army) will review such action no less than every 5 years.

A series of 5-Year Reviews will be conducted at the Dry Lake Area to determine whether the munitions response actions selected continue to minimize explosives safety risks and continue to be protective of human health, safety, and the environment. These 5-Year Reviews will also provide an opportunity to assess the applicability of new technology for addressing previous technical impracticability determinations that may have been present throughout the EE/CA process.

The scope of the 5-Year Review will be specific to the Dry Lake Area and will depend upon the response objectives and the specific response actions implemented. The reviews will evaluate appropriate site-specific factors that may impact the continued effectiveness of selected munitions response actions at the Dry Lake Area. These factors may include changes in physical conditions at the site, changes in public accessibility, changes in land use, and the applicability of new technology for addressing a previous technical impracticability determination. The 5-Year Reviews will also evaluate the maintenance and enforcement of the Institutional Controls implemented as part of the selected remedy.

The 5-Year Review process for the Dry Lake Area will answer three general questions:

- Are the selected response actions functioning as intended?
- Are the assumptions used at the time the munitions response actions were selected still valid?
- Does new information indicate that the selected munitions response actions no longer minimize explosives safety risks or are no longer protective of human health, safety, and the environment considering the best available technology?

Data Quality Objectives (DQOs) will be developed throughout the 5-Year Review planning process, as described in Equipment Manual (EM) 200-1-2, *Technical Project Planning (TPP) Process*. These DQOs will assure that the proper data are collected during all 5-Year Reviews and that these data will be consistent with all applicable 5-Year Review standards.

Implementation of Land Use Controls (LUCs). Since it is not practicable to remove all MEC across the entire Dry Lake Area, LUCs will be a necessary component of the response action in order to prevent the public from inadvertently contacting MEC that could be exposed due to wind and water erosion. The LUCs will apply to the whole Dry Lake Area (Figure 2). The LUC performance objectives for the Dry Lake Area are described below. Specific, detailed LUC implementation actions will be identified in the Removal Action Workplan.

LUCs Performance Objectives for the Dry Lake Area:

- Ensure that no construction on or excavation of the lakebed occurs without prior regulatory approval.
- Ensure no residential use or development of the site, including the construction of hospitals, schools, day-care centers, and playgrounds.

Land Use Controls. Land Use Controls are physical, legal or administrative mechanisms that restrict the use of, or limit access to, contaminated or unsafe property in order to reduce risk to human health and the environment. Physical mechanisms, also called engineering controls, encompass a variety of engineered remedies to contain or reduce contamination and/or physical barriers to limit access to property such as fences or signs. Institutional controls are a subset of LUCs and are primarily legal mechanisms imposed to ensure the continued effectiveness of and integrity of the selected response action. LUCs also encompass other control measures such as administrative or governmental mechanisms such as permit programs, safety training, and zoning, that help to restrict non-compatible activities, prevent exposure or educate the public as to the risks that may be posed by a site. The primary LUC performance objective for the Dry Lake Area is to attain the Remedial Action Objective of preventing human exposure to any residue MEC that may remain after the completion of the other response actions proposed for the site. The proposed LUCs for the Dry Lake Area are intended to complement the planned remedial actions.

Specific language regarding the implementation, monitoring, reporting and enforcement of LUCs will be included in the Remedial Action Work Plan that will govern the response actions, but generally speaking the Army will be responsible for implementing, maintaining, and monitoring the remedial actions (including the LUCs) before property transfer. The transferee will be responsible for maintaining the LUCs after transfer unless otherwise noted. The Army will continue to ensure that the LUC performance objectives are being met by conducting five-year reviews in accordance with CERCLA and the NCP.

The Army may contractually arrange for third parties to perform any of the actions associated with LUCs, although the Army is ultimately responsible under CERCLA for the successful implementation of LUCs, including the maintenance, monitoring and review of LUCs. Monitoring, maintenance and other controls as established in accordance with this Action Memorandum and the appropriate transfer documents will be continued until LUCs are no longer necessary.

The Former Honey Lake Demolition Range-Dry Lake Area is contaminated with MEC and is currently leased to the Center for Urban Watershed Renewal (CUWR) (Lease in Furtherance of Conveyance). Under the lease terms CUWR will manage the property, but is not allowed to access it without prior written approval and escort from the Army. The lease restrictions are in place and operational and will remain in place until the property is transferred by deed. At the time of deed transfer, lease restrictions will be superseded by restrictions to be included in the federal deed and the State Land Use Covenant as described in this Action Memorandum.

Deed Restriction and Reservation of Access. The federal deed(s) for any property containing MEC will include a description of the residual contamination on the property, consistent with the Army's obligations under CERCLA Section 120(h) and the specific restrictions set forth in this Action Memorandum and the implementing Work Plan. Institutional Controls, in the form of deed restrictions, are an "environmental restriction" under California Civil Code Section 1471. The deed will contain appropriate provisions to ensure that the restrictions continue to run with the land, as provided in California Civil Code Section 1471 and will include of legal description of the affected area.

The Army and regulatory agencies may conduct inspections of LUCs and the affected property. The deeds will also contain a reservation of access to the property for the Army and the State of California and their respective officials, agents, employees, contractors and subcontractors for purposes consistent with the Army Installation Restoration Program or the Federal Facilities State Remediation Agreement. The Army will provide such access to regulatory agencies prior to transfer.

The environmental restriction is the basis for part of the CERCLA 120(h)(3) covenant that the United States is required to include in the deed for any property that has had hazardous substances stored for one year or more or known to have been released or disposed of on the property. During the time between adoption of this Action Memorandum and deeding the property, appropriate use restrictions for property are implemented as described in this Action Memorandum and the implementing Work Plan.

Notice of Land Use Control. The Army will include the specific deed restriction language set forth in this Action Memorandum in the deed for the Former Honey Lake Demolition Range-Dry Lake Area, and will provide a copy of the deed to the DTSC as soon as practicable after the transfer of fee title. The Army will provide information to the property owners regarding the necessary LUCs in the draft deed. The signed deed will also include the specific land use restriction as well as a condition that the transferee execute and record a State Land Use Covenant, within 10 days of transfer, to address any State obligations pursuant to State law, including 22 Code of California Regulations, Section 67391.1. The information will also be communicated to appropriate State and local agencies with authority regarding any of the activities or entities addressed in the controls to ensure that such agencies can factor the information into their oversight, approval, and decision-making activities.

Prior to conveyance of any Army property overlying MEC contamination, DTSC representatives will be given reasonable opportunity to review and comment on the applicable deed language and associated rights of entry for the DTSC for purposes of Institutional Controls oversight and enforcement.

The Army will also provide notification to Lassen County and local landowners in the vicinity of Former Honey Lake Demolition Range-Dry Lake Area that MEC will remain after the completion of the remedial action.

Evaluations/Monitoring. After property transfer, the owner will conduct monitoring, provide reports, and, in accordance with the provisions outlined in the remedial action work plan , undertake prompt action to address activity that is inconsistent with the LUC Performance Objectives or use restrictions, or any action that may interfere with LUC effectiveness. These evaluations will be provided to the DTSC. The monitoring reports will be used in preparation of five-year reviews to evaluate the remedy's effectiveness.

The five-year reviews conducted by the Army will also address whether the Institutional Controls in the Action Memorandum was inserted in the deed, if property was transferred during the period covered, whether the owners and State and local agencies were notified of the Institutional Controls affecting the property and whether use of the property has conformed to such Institutional Controls. Five-year review reports will make recommendations on the continuation, modification or elimination of annual reports and Institutional Controls monitoring frequencies. Five-year review reports are submitted by the Army to the regulatory agencies for review and comment.

Although the Army is transferring procedural responsibilities to the transferee and its successors by provisions to be included in the deed(s) and may contractually arrange for third parties to perform any and all of the actions associated with the Institutional Controls, the Army is ultimately responsible for the remedy.

Response to Violations. After property transfer, if the transferee fails to satisfy its obligations pursuant to the State Land Use Covenant, DTSC may enforce such obligations against the transferee. If there is failure of the selected remedy or a violation of selected remedy obligations (for example, an activity inconsistent with Institutional Controls objectives or use restrictions, or any action that may interfere with the effectiveness of Institutional Controls), DTSC will notify the Army in writing of such failure as soon as practicable (but no longer than 14 days) upon discovery of the inconsistent activity or action that interferes with the effectiveness of the Institutional Controls, and initially seek corrective action or other recourse from the transferee. Within 21 days following DTSC's notification, the Parties shall confer to discuss re-implementation of the selected remedy or other necessary remedial actions to address the breach of the Institutional Controls. Once DTSC reports that the transferee is unwilling or unable to undertake the remedial actions, the Army will within 30 days inform the other Parties of measures it will take to address the breach.

Approval of Land Use Modification. The owner shall not modify or terminate land use controls, or implementation actions that are part of the selected remedy without approval by the DTSC and the Army. The owner shall seek prior concurrence before any anticipated action that may disrupt the effectiveness of the land use control or any action that may alter or negate the need for land use controls.

Any grantee of property constrained by the Institutional Controls imposed through their transfer document(s) may request modification or termination of Institutional Controls. Modification or termination of Institutional Controls, except the State Land Use Covenant (discussed below), requires Army and DTSC approval.

State Land Use Covenant Modification. Any modification or termination of the State Land Use Covenant must be undertaken in accordance with State law and will be the responsibility of the transferee or then-current owner or operator.

9.0 TRADE-OFF ANALYSIS

The response actions selected for the Dry Lake Area are sector specific and were developed to provide the most effective protection to the public from any remaining MEC hazards. The recommended response actions were based on numerous data, including past, current, and future land use; the quantity and location of MEC and MD recovered during the EE/CA field investigation and the data collected during previous investigations. The results of the OERIA process, a qualitative risk analysis tool, is presented in Chapter 5.0 of the EE/CA Report. The selected response actions were also chosen on a detailed evaluation of the effectiveness, implementability (including regulatory agency and local community acceptance), and cost of each of the seven response alternatives, as presented in Chapter 6.0 of the Final Dry Lake Area EE/CA Report (Earth Tech, June 2006). The response action selected for each sector is the best alternative for that sector, as determined by the Dry Lake Area EE/CA.

10.0 DOCUMENTATION OF SIGNIFICANT CHANGES

No significant changes to the proposed final response actions are anticipated. If the proposed response actions outlined in this Action Memorandum are delayed or are not implemented, the potential exists for continued endangerment to human safety, welfare, or the environment.

11.0 RESPONSIVENESS SUMMARY

Table 2 provides a summary of all public involvement activities associated with development of the Dry Lake Area EE/CA.

Table 2. Dry Lake Area Public involvement

Activity	Date
RAB Meeting	9 April 2003)
RAB Meeting	16 July 2003
RAB Meeting	10 March 2004
RAB Meeting	12 May 2004
RAB Meeting	7 July 2004
RAB Meeting	22 September 2004
RAB Meeting	16 March 2005
RAB Meeting	11 May 2005
RAB Meeting	10 August 2005
RAB Meeting	16 November 2005
Public Review Meeting for EE/CA and Action Memorandum	TBD

RAB = Restoration Advisory Board